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Before the
FEDERAL COMMUNICATIONS COMMISSION
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In the Matter of)
)
The Development of Operational, Technical)
and Spectrum Requirements For Meeting)
Federal, State and Local Public Safety)
Agency Communication Requirements)
Through the Year 2010)
)
Establishment of Rules and Requirements)
For Priority Access Service)
)

WT Docket No. 96-86

Comments of Ericsson Inc.

Ericsson Inc. ("Ericsson") hereby submits its comments in the Second Notice of Proposed Rulemaking ("Second NPRM") in the above-captioned proceeding.¹ In support of its comments, Ericsson states as follows:

The Second NPRM seeks comment in three areas: (1) adoption of service and technical rules for the 24 MHz of spectrum in the 746-806 MHz band the Commission proposes to allocate for public safety services for interoperability and general service; (2) adoption of rules for the establishment of priority access by commercial wireless service providers to entities who are engaged in providing assistance in emergency and disaster situations; and (3) adoption of technical rules to protect broadcast licensees operating in the 746-806 MHz band from interference. Ericsson's comments in this proceeding are limited to specific aspects of the three general areas on which comment is sought.

¹ *In the Matter of The Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010, Establishment of Rules and Requirements for Priority Access Service, Second Notice of Proposed Rulemaking*, FCC 97-373, __ FCC Rcd __ (Released October 24, 1997) ("Second NPRM").

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I. Public Safety Communications

A. FCC Vision Statement

As a manufacturer of telecommunications systems and equipment for the public safety community, Ericsson participated extensively in the Public Safety Wireless Advisory Committee ("PSWAC"). Ericsson also filed comments in earlier stages of WT Docket No. 96-86 and fully supported the need for additional spectrum to enable those in the public safety community to provide more efficient services which will redound to the benefit of all members of society. Ericsson welcomed Congressional action which requires the Commission (1) to allocate 24 MHz of spectrum in the 746-806 MHz band for public safety purposes² and (2) to commence the assignment of licenses in the new public safety band on an expeditious basis.³

Thus, Ericsson agrees that the Commission's goal should be to address spectrum shortage issues; to ensure that interoperability of communication between and among public safety agencies can be accomplished; and to ensure that technologies which can enhance public safety communications abilities are made available through competitive means at competitive prices. It also agrees with the Commission's statement that the lack of interoperability is a critical concern for public safety today:

Over the past decade, police, fire, emergency medical, and other public safety providers have been confronted by a number of problems that threaten their ability to fulfill their mission of protecting the public. Frequencies have become congested in many areas. Interoperability (the ability of different agencies to communicate across jurisdictions and

² Despite the fact that 24 MHz of spectrum for public safety is a welcome allocation, it is not sufficient to satisfy the unmet needs of the public safety community.

³ Section 337(b)(1) of the Communications Act of 1934, as amended, requires the FCC to complete the allocation of 24 MHz of spectrum in the 746-806 MHz band for public safety by December 31, 1997 and to commence assigning licenses in this band by September 30, 1998.

with each other) has been difficult because of multiple frequency bands and incompatible equipment.⁴

Notwithstanding its general support for the proposition that public safety desperately needs unencumbered spectrum for nationwide interoperability, Ericsson is not persuaded that the Commission is correct that “most” of the 24 MHz of spectrum in the 746-806 MHz band should be used for interoperability or that it is necessary for the Commission to mandate interoperability for data, image/high speed data (“HSD”) and video. For reasons which will be discussed in greater detail below, simplicity should be the buzzword for interoperability spectrum. The interoperability portion of communications in the 746-806 MHz band should be simple to implement; simple to manufacture and simple to use, all of which will make equipment inexpensive and widely available. Thus, Ericsson supports PSWAC’s recommendation that 2.5 MHz of spectrum should be made available for purposes of interoperability for voice systems.⁵ The modulation scheme for voice communications in the interoperability spectrum should be analog FM. Digital modulation, encryption and trunking, all of which are beneficial in other contexts, should not be allowed in the interoperability band because they add unnecessary complexity and cost and may, in fact, decrease the likelihood of achieving successful voice communication at very critical times.

This is not to suggest that Ericsson opposes interoperability for data, image/HSD and/or video. However, in view of the fact that these uses are more spectrum intensive, more complex to implement and more costly to manufacture (and are of lesser value when compared to basic voice communications in true disaster/emergency situations), they

⁴ Second NPRM, para. 3.

⁵ PSWAC Final Report, p. 21.

should be implemented outside the context of the interoperability spectrum and should be considered in the context of the general service portion of the 24 MHz of public safety spectrum in the 746-806 MHz band.

B. Interoperability Spectrum

1. Location. Ericsson agrees that the 24 MHz of spectrum in the 746-806 MHz band allocated for public safety is an appropriate location for a designated nationwide interoperability band given the spectrum that appears to be available.⁶

2. Types of Communication. The Second NPRM describes a variety of different voice, data and video communication uses that might be offered in the interoperability band. The FCC proposes to make interoperability spectrum available for 4 general types of communications, *viz.*, (1) voice channels only (with data capability on such channels); (2) voice and data channels only; (3) voice, data, image/HSD, slow motion video, and full motion video channels; and (4) channels that would accommodate some other combination of uses.

Ericsson suggests that while data, image/HSD and video are, or will be, communications uses that will be invaluable to the public safety community, they do not meet the primary and immediate needs of the public safety community. To immediately provide the public safety community with interoperability which will do the greatest good in the shortest period of time, Ericsson suggests that a maximum of 2.5 MHz of

⁶ Nonetheless, Ericsson also agrees with the conclusions reached by PSWAC that spectrum at or below 512 MHz would be better from an interoperability standpoint.

interoperability spectrum be allocated for voice use.⁷ The greatest need of the public safety community during emergencies and national disasters is the ability to engage in voice communications immediately and rapidly, especially during the initial stages of emergency situations. As various public safety agencies converge on the scene of an emergency or disaster it is important to be able to immediately communicate with one another without having to monitor or manipulate complicated data and/or video terminals. Similarly, during the initial stages of disaster and emergency situations, time is of the essence. The need for bandwidth intensive applications such as transmission and reception of mugshots or fingerprints, or the need for either slow motion video or full motion video is not the highest priority since transmission and reception takes a substantial amount of time. Subsequent to the initial stages of a disaster, agencies responding to emergency situations will have more time to deploy equipment that will provide image/HSD and/or video capability.

As part of its inquiry on this topic, the Commission asks how interoperability spectrum would actually be used. Ericsson recommends that the FCC establish a national calling channel for each of the 8 public safety services similar to Channel 16 in the Marine Mobile service. Each particular national calling channel would be monitored by designated public safety agencies for each of the 8 public safety services. Upon receiving a request for an interoperability channel, the public safety agency monitoring the calling channel would advise the caller to switch to another specific interoperability working

⁷ Depending on channel spacing selected for the interoperability band, it is conceivable that less spectrum would be needed for interoperability. For example, 2.5 MHz may be needed if the FCC decides that 25 kHz spacing is appropriate. However, if 12.5 kHz spacing is required, as little as 1.25 MHz of spectrum might satisfy the need for nationwide interoperability.

channel within the interoperability band. This method of allocating interoperability channels would create a mechanism by which designated local officials with full knowledge of the nature of the disaster could allocate channels to the various public safety agencies as demanded by the nature of the emergency itself.

For example, firefighters responding to a disaster situation not within their “home” area, upon reaching the disaster scene, would know to call in on the national calling channel for fire services. The dispatcher receiving the call would then assign those firefighters to a working channel or channels. Working channels would be dynamically assigned based on the nature of the emergency.⁸ Under this scenario, the FCC’s responsibility would be to set certain general parameters for the operation of nationwide interoperability and to ensure that a common protocol was used for the interoperability spectrum. Local public safety agencies would have the responsibility to allocate individual channels based on the specific local emergency. The macro-responsibility of the Commission combined with the micro-responsibility of local public safety agencies will best ensure the efficient operation of nationwide interoperability spectrum.

3. Transmission Technology. To ensure interoperability, the Second NPRM proposes to specify either analog FM modulation or digital modulation technologies. With regard to voice, the Commission specifically asks for comment on whether analog

⁸ It is conceivable that some working channels could be assigned as “common” working channels between different types of entities, i.e., police, fire, ambulance, etc. based on the assessment and expertise of the local dispatch operators who are in the best position to make such determinations.

FM or digital modulation should be used or whether a modulation scheme should even be mandated by the Commission.⁹

It is critically important for the Commission to establish nationwide interoperability spectrum for voice communications. In keeping with the concept that “simplicity” should be the overarching goal for the interoperability band, the Commission should specify analog FM, rather than digital, as the modulation scheme for this spectrum. At paragraph 55 of the Second NPRM, the Commission correctly notes that there are many problems associated with the selection of digital modulation for interoperability including, but not limited to, the fact that most public safety equipment in operation today uses analog FM and no standards have yet been developed for digital equipment in the 746-806 MHz band. As the Commission recognizes, the process for adopting standards, even when adopted by an accredited standards setting organization, can take a substantial amount of time based on the numerous technical issues that need to be evaluated by all interested parties. To meet the critical immediate demand for nationwide interoperability for voice communications, the Commission should mandate that a well-tested, existing modulation technique be used, i.e., analog FM.

Though not a new technology, the use of analog FM modulation has many advantages and is clearly the modulation technique of choice for the interoperability spectrum. For example, analog FM has been in use for many years and is widely regarded as a robust technology. It is a technology proven to get messages through even in harsh radio frequency environments due to its “capture effect.” Moreover, virtually all

⁹ Because Ericsson does not believe the Commission should allocate interoperability spectrum for data, image/HSD and video, it does not believe the Commission should adopt a preferred modulation technique for such services.

manufacturers of public safety equipment are familiar with analog FM. Thus, selection of analog FM modulation will result in multiple vendors making “interoperability radios” which, in turn, will result in lower equipment prices for the public safety community. The existence of low cost interoperability radios will be a significant first step for addressing the multi-band interoperability problem recognized by PSWAC.¹⁰

Ericsson believes low cost portable radios should be a foundation requirement for interoperability radios. Use of analog FM technology will keep the cost of interoperability radios as low as possible by, among other things, allowing manufacturers to take advantage of economies of scale and scope. In fact, if analog FM modulation is required, Ericsson envisions that manufacturers will build “throw away” interoperability radios that can be stockpiled by public safety organizations and distributed as necessary in emergencies. As a corollary, use of technology more complex than analog FM will only add to the cost of interoperability radios.

Furthermore, in those situations where the interoperability capability will be an inherent part of a particular system and the users will not rely on a separate interoperability radio, many, if not all, digital implementations will include an analog FM mode requirement. This requirement will allow any user to implement whatever technology it believes best suits its needs for the general service channels, while at the same time retaining full capability to operate as required in the interoperability spectrum. Requiring the use of an IPR free technology (analog FM) for the voice interoperability spectrum will maximize the possibility of achieving the desired and necessary competition

¹⁰ PSWAC Final Report, p. 19.

in the equipment marketplace while at the same time providing no impediment to the introduction of existing or new and evolving technologies in the general service spectrum.

4. Channel Spacing. To keep the cost of interoperability radios as inexpensive as possible, Ericsson believes the Commission's choice of channel spacing for analog FM radios should be either 25 kHz or 12.5 kHz. Ericsson expresses no preference on which should be used inasmuch as it manufactures radios using both 12.5 kHz or 25 kHz spacing. However, Ericsson does urge that the Commission's choice of 12.5 or 25 kHz spacing be consistent with the Commission's choice of authorized bandwidth.

5. Equipment Standards. The Commission's historical policy of not imposing receiver standards on the public safety industry should continue to be applied in the context of interoperability band voice channels. As the FCC correctly notes, imposition of receiver standards will serve only to increase the cost of interoperability radios which could have the effect of reducing demand for such products. Notwithstanding the foregoing, to the extent the public safety community desires to have receivers which operate more efficiently, albeit at higher cost, manufacturers will build to meet the demands of the marketplace.

All radios that operate in the 24 MHz of public safety spectrum in the 746-806 MHz band should be capable of operating on all interoperability channels in the band. This is important to ensure that nationwide interoperability becomes a reality. As important, the FCC should establish a common "nomenclature" or "protocol" to describe the channels in the voice interoperability band. By mandating a common nomenclature, public safety agencies, no matter where located, will understand commands or jargon used by others sharing the interoperability spectrum. This can become a critical operational

issue in an emergency situation, especially if a user from one agency or region arrives in a “foreign” region and is not aware of the local calling custom in the area.

For example, the FCC has “numbered” all maritime and citizens band frequencies throughout the country. Similarly, the Commission could (1) number all interoperability channels; (2) designate a nationwide calling channel for a given public safety service; and (3) designate a certain number of interoperability channels for each service. Channel 1 might be the nationwide police calling channel with channels 2 through 12 designated as working channels for police services. Channel 13 might be the nationwide calling channel for fire services with channels 14 through 24 for fire working channels, and so on. After channels are established for the various Public Safety services, the remaining channels could be commonly numbered but not allocated to specific services. This would provide local public safety agencies more flexibility in assigning channels in an emergency.

It is technically possible for manufacturers of radio equipment to incorporate the interoperability channels into radios used in other bands, such as for example, the 806-824/851-869 MHz band. Ericsson does not recommend, however, that the Commission require that the 746-806 MHz band interoperability channels be included in radios which operate in other bands. The design process necessary to incorporate the interoperability channels into radios other than in the 746-806 MHz band will increase the complexity and cost of such devices. This, in turn, may preclude public safety entities who are already under budgetary constraints from purchasing interoperability radios thereby defeating the purpose of mandating an interoperability band. To the extent the marketplace demands dual band radios, the Commission should refrain from adopting regulations which would inhibit manufacturers from making dual band public safety radios.

6. Eligibility, Use and Licensing.

A. Definitions. Ericsson agrees with the Commission that the Congressional definition of “parties” intended to be eligible for public safety spectrum in the 746-806 MHz band excludes Federal agencies.¹¹ In view of the fact that Federal agencies have access to their own spectrum, it is not necessary for such agencies to be licensed to use spectrum in the 746-806 MHz band. These agencies do, however, need to communicate with state and local and other entities authorized for licensing in the public safety portion of the 746-806 MHz band. Accordingly, rather than being precluded from using the 746-806 MHz spectrum, Ericsson asserts that Federal users should be able to access the 746-806 MHz band as “end users” of interoperability spectrum licensed to “eligible” public safety agencies.¹²

B. National and Regional Planning. Ericsson believes the Commission should establish national policies and minimum technical standards for the interoperability spectrum. As described in more detail above, the FCC should establish a national policy on the use of interoperability channels which (a) includes the designation of nationwide calling channels¹³ and (b) minimum technical requirements which govern the use of the interoperability channels (i.e., analog FM). The various state and local public safety agencies should be allowed (but not required) to devise local interoperability plans which govern the use of interoperability channels in a particular area. Allowing state and local

¹¹ Second NPRM, para. 76.

¹² All eligible users should be able to operate interoperability radios without the need to obtain a license from the FCC. In this regard, such a “licensing” scheme would be similar to the use of Marine Mobile radios or Citizens Band radios. Eliminating the need for licensing would reduce the paperwork burden on the Commission and enable eligible public safety end users to quickly deploy interoperability radios in an emergency situation.

¹³ See, discussion in Section B.3.

emergency operations authorities to adopt such plans rather than regional planning commissions (“RPCs”) serves two primary purposes. First, state and local emergency operation authorities are familiar with the particularized needs of their constituents. Second, state and local authorities, unlike RPCs who operate outside a governmental framework, are subject to certain checks and balances thereby ensuring due process to all concerned.

Establishment of a shared jurisdictional approach to the use of interoperability channels ensures that the Federal goal of nationwide interoperability will be met on the one hand, and that state and local public safety agencies will make decisions on how the spectrum is used and/or allocated in their local areas, on the other hand.

7. Trunking on Interoperability Spectrum.

Ericsson does not believe the Commission should mandate the use of trunking technology for the interoperability channels. As a manufacturer of trunked radio systems used in a variety of environments, Ericsson is fully aware of the benefits of trunking technologies, e.g., the flexibility it provides end users and the spectrum efficiency that results therefrom. For example, the Commission correctly states that “...a shared trunked system employed by public safety agencies in a particular area could register the radios used by all of their field personnel, by ID number, in a database, and the system could control and manage communications among such users. In the event that non-resident personnel entered the area during an emergency, their radio units could be added to the database.”¹⁴ Furthermore, the Commission notes that in large scale disasters, it is

¹⁴ Second NPRM, para. 98.

important to establish communications rapidly. Notwithstanding the foregoing, in a disaster situation in which voice interoperability channels will be used, especially in the early moments of the arrival of public safety and emergency personnel, there will be little time to establish trunked systems capable of providing the above-listed benefits.

Consistent with its philosophy that “simpler is better,” the preferred course of action is for the Commission to require the use of non-trunked technology. Emergency personnel converging on a disaster situation will be able to quickly and easily establish instantaneous voice communications with other personnel at the scene. By using the nationwide calling channel, dispatch operators in an area can assign channels based on their assessment of the nature of the disaster and the various public safety agencies participating in the emergency operations.

8. Technical Standards for Interoperability Spectrum

Ericsson does not believe it is necessary for the Commission to mandate technical standards for the public safety interoperability spectrum except to mandate that non-trunked, analog FM be used and that a set of nationwide calling channels and associated working channels be established for the interoperability spectrum. Resolution of complex issues related to due process requirements for mandating digital standards, trunking protocols, encryption methods, use of proprietary technology and other factors not present with regard to analog FM technology, will serve only to delay the deployment of nationwide interoperability and increase its cost.

If, however, the Commission decides to require digital modulation in the interoperability spectrum certain technical standards must be mandated to achieve the appropriate air interface commonality needed to satisfy the unique public safety

interoperability requirement of direct unit to unit communications. Due to the fact that the goal of nationwide interoperability is sought and the marketplace for public safety equipment has not been characterized as a fully competitive marketplace,¹⁵ it is important for the Commission to take a stronger role in assessing the validity of any technical standards considered for mandate in this public safety interoperability spectrum. The unique requirements and marketplace conditions distinguish the need for FCC vigilance in the public safety arena which is not the case in other CMRS services.¹⁶ It is imperative for the Commission to ensure that the processes utilized in the development of any standards considered for the public safety interoperability spectrum, are characterized as ones in which due process is afforded to all interested parties. Ericsson believes that commissioning a Federal Advisory Committee pursuant to the Federal Advisory Committee Act,¹⁷ much like PSWAC, would be the best way to determine what technical standards should be mandated for the public safety interoperability spectrum. PSWAC is a notable example of the benefits derived from operating pursuant to the Federal Advisory Committee Act. The PSWAC Final Report and the work that was involved in preparing the report have been widely accepted both inside and outside the public safety community because of the inclusionary rather than exclusionary atmosphere fostered by the PSWAC Steering Committee. Prior to mandating any digital standards for use in the public safety interoperability spectrum, the Advisory Committee, or if an Advisory Committee is not

¹⁵ Second NPRM, para. 24.

¹⁶ The marketplace for CMRS equipment is fully competitive today as evidenced by various digital technologies being deployed in the marketplace. Standards for digital equipment used in the CMRS marketplace should be left to voluntary standards organizations pursuant to established procedures. See also, *Public Interest Standard Setting for Public Safety Wireless*, Michael L. Katz, D.Phil. for a complete review of the appropriate considerations encountered in establishing standards for public safety.

¹⁷ 5 U.S.C. Appendix 2.

used, the Commission, must ensure that the standards were developed by ANSI-accredited standards setting organizations (“SDOs”), which have meticulously followed the ANSI-approved procedures in all facets of the standards’ development, i.e., the process used by the SDO is above reproach.

The foregoing should not be interpreted to mean that the Advisory Committee or Commission should not be allowed to develop their own standards or to consider digital standards developed by non-accredited organizations for use in the public safety interoperability spectrum. If the Advisory Committee or the Commission decide to develop their own standards, the provisions of the Federal Advisory Committee Act and the Administrative Procedures Act would provide ample evidence of the requisite due process. In the event the Advisory Committee or Commission is willing to consider standards developed by non-accredited organizations, the Advisory Committee or Commission must assure that the process used by these bodies afforded all interested parties due process. To ensure due process in this situation, Ericsson firmly believes the Commission should adopt rules embodying the principles of Section 273(d)(4) of the Communications Act of 1934, as amended, to guide any non-accredited organization developing any standard which the Advisory Committee or the Commission may mandate for the public safety spectrum.

In this regard, in its reply comments in the *Notice of Proposed Rulemaking* in this proceeding, Ericsson discussed in great length the need for the Commission to assert its authority to ensure that any technical standards adopted by non-accredited standards

bodies be done on a fair and equitable basis. Ericsson specifically, incorporates by reference herein, its comments on this subject.

C. General Service Spectrum

The Second NPRM requests comment on a variety of proposals related to the use of the public safety spectrum in the 746-806 MHz band not allocated for interoperability, i.e., the “general service” spectrum. In particular, the Commission asks for comment on whether the NPSPAC model, or some modification thereof, should be used in conjunction with Commission adoption of certain national standards for this spectrum and how the spectrum should be used.

The Commission should establish a national framework for the use of the general service public safety spectrum in the 746-806 MHz band. The FCC should also exercise exclusive jurisdiction to adopt operational parameters for the band, including the number and types of channels which should be authorized for use by qualified public safety entities and any minimum technical standards deemed necessary.

Ericsson does not believe there is a specific need to adopt comprehensive technical standards for the general service portion of the 746-806 MHz band allocated for public safety. In fact, Ericsson cautions that adoption of comprehensive technical standards for the general service portion of the 746-806 MHz spectrum may inhibit the Commission’s goal of achieving vigorous competition. Furthermore, specified technical standards may inhibit the introduction of new and emerging technologies in public safety communications. However, to the extent the Commission decides that comprehensive technical standards are necessary for the general service spectrum for the general service spectrum, or in the event that the Commission authorizes any planning organization such

as the NPSPAC regions to adopt technical standards for the general service spectrum, the procedures to be used in adopting such standards should be the same as those discussed in Section B.8 above.

Ericsson does not believe the public interest would be best served by allowing RPCs to have a role in defining parameters of service or technical standards since that might have the effect of creating a patchwork of different channel configurations and/or technical standards for the general service public safety spectrum in the 746-806 MHz band.¹⁸ Though the general service spectrum will not specifically be allocated for interoperability, a patchwork of 55 different sets of technical standards will tend to inhibit the development of de facto standards that the marketplace may adopt. This, in turn, could have an adverse impact on the ability of manufacturers to compete in the equipment marketplace and prevent prices from being as low as possible.

The Commission also seeks comment on the uses to which channels in the general services spectrum should be put. Ericsson does not believe video is an appropriate use of the 746-806 MHz band due to the fact that it is so spectrum intensive. Since the 24 MHz of spectrum being allocated in the 746-806 MHz band does not satisfy all the spectrum needs of the public safety community, Ericsson believes the vast majority of channels should be allocated for voice use.

Because the predominate immediate need for the public safety community is for basic voice channels, the Commission should channelize the general service band so all channels are capable of being used individually for voice. However, the Commission

¹⁸ RPCs or similar bodies should similarly not be able to impose on manufacturers a requirement that manufacturers must be willing to develop and manufacture equipment with technical standards and parameters inconsistent with the need for nationwide interoperability and due process.

should allow licensees of general services spectrum to aggregate channels so they can engage in services which require wider bandwidths or disaggregate channels to provide services which might require less bandwidth.

In addition to allowing aggregation/disaggregation of channels and technical flexibility which promote efficient use of the spectrum, the FCC should mandate that an efficiency standard be adopted. The standard should require the use of 6.25 kHz channels or equivalent efficiency for voice communications. This will necessitate public safety utilizing spectrum in a more efficient manner. Moreover, establishing such an efficiency requirement is consistent with the PSWAC assumption for the year 2010 that the average public safety voice radio system would require only 4 kHz bandwidth per active voice conversation.¹⁹ Establishing a 6.25 kHz efficiency requirement for the general service spectrum is a first step towards satisfying the PSWAC assumption.

With regard to transmission technology, the Second NPRM asks for comment on whether there is a need to mandate a particular transmission technology. As noted previously, Ericsson does not believe there is a need to adopt comprehensive technical standards for the general service spectrum.²⁰ It believes the marketplace will dictate transmission standards deemed appropriate and beneficial for the public safety community.

¹⁹ When identifying the spectrum needs for public safety in the year 2010, the PSWAC Spectrum Requirements Subcommittee assumed that a 4 kHz equivalent efficiency would be met. PSWAC Final Report, pp. 58-59.

²⁰ The need for strong Federal intervention in the standards process for the interoperability spectrum is required due to the Commission's correct assumption that nationwide interoperability is a critical need for the public safety community. Inasmuch as nationwide interoperability is not necessarily required for the general service spectrum, Federal intervention in the standards adopting process is not needed as long as due process is afforded to all interested parties in the context of any standards adoption process.

Notwithstanding the foregoing, and as expressed above, any standards that are adopted should be accomplished in the manner described in Section B.8 of these Comments.²¹

Equipment Standards. Ericsson agrees with the Commission's tentative conclusion that there is no need to set receiver standards for the general service spectrum since that is a decision better left to the marketplace.

Emission Mask. Ericsson submits that the 12.5 kHz equipment mask currently used for the refarmed channels is appropriate to use for the general service spectrum in the 746-806 MHz band. It also asserts that for purposes of technical flexibility, any mask adopted should apply only at the band edges of contiguous, aggregated/disaggregated channels.

Construction Requirements. Since spectrum allocated for public safety use in the 746-806 MHz band will not be accomplished through the use of competitive bidding, it is necessary to adopt construction requirements. This will serve to avoid warehousing of scarce spectrum. Nonetheless, it is important to note that equipment which will be deployed in this band has not yet been developed. To the extent the FCC commences a process of assigning licenses for this spectrum, construction deadlines should be adopted which allow manufacturers sufficient time to develop and manufacture equipment for the band.

II. Priority Access Service

Ericsson agrees with the Commission's conclusion that the instant proceeding is one in which it should start to evaluate proposals relative to priority access. Nonetheless, Ericsson is not of the view that there is a "...nexus between considerations of priority

²¹ See, pp. 13-16.

access and the needs of the public safety community.”²² The issue of priority access is separate and distinct from the needs of public safety for more spectrum to carry out their functions. The need for 24 MHz of spectrum in the 746-806 MHz band for public safety has been independently justified. In fact, as noted above, despite the fact that 24 MHz of spectrum is being made available for public safety, more spectrum than that being allocated is necessary to satisfy all the needs of the public safety community.

While certain types of public safety agencies or end users can make use of commercial spectrum, that should not be viewed as a substitute for public safety agencies having access to their own spectrum. The use of dedicated “public safety” spectrum by licensees is different than the use of commercial spectrum by end users who have a public safety function. For example, in disaster situations, commercial spectrum often becomes congested very quickly resulting in the inability of end users to make and/or receive calls. The same problems occur less frequently when public safety spectrum is used. Additionally, many public safety radio systems allow dispatch operations which are useful in an operational context.

Thus, while Ericsson supports the Commission’s evaluation of the need to establish priority access for CMRS systems, it firmly believes that public safety agencies need additional dedicated private spectrum. The FCC’s decision on the priority access portion of this proceeding should be made independent of the allocation of 24 MHz of public safety spectrum in the 746-806 MHz band.

Ericsson does not believe priority access should be made mandatory for all CMRS carriers. Carriers alone are in the best position to determine if priority access should be

²² Second NPRM, para. 186.

offered. CMRS carriers should have the option of deciding whether to provide priority access. If any CMRS carrier does, however, choose to make priority access available, it should comply with certain minimum technical and operational standards adopted by affected industry groups and members of the public. Standards in this regard are necessary to ensure that the user interface is uniform throughout the U.S. For example, if priority access is provided by a given CMRS carrier, the various priority levels should be uniform on a nationwide basis. Similarly, the means of making a priority request should be the same for each subscriber of a CMRS system that is entitled to priority access. For example, just as dialing "911" is universally known as the dialing pattern to obtain emergency services, dialing "2xx" or some other agreed upon dialing pattern, should be used to enable an eligible subscriber to obtain priority access.²³ Establishment of certain basic, uniform technical standards, the type of which are described above, will eliminate confusion and the requirement for subscribers to learn new commands to the extent they change service providers.

III. Protection of Television Services

Ericsson recognizes that the FCC has committed to "fully protect" analog and digital television operations during the DTV transition period.²⁴ A balancing of the public needs involved as well as consideration of Congressional intent in adopting the 1997 Amendments demonstrates clearly that the rules adopted to protect television should be carefully crafted to assure that they do not waste limited public safety spectrum by providing unnecessary overprotection. Ericsson believes that "fully protect" should be

²³ Ericsson assumes that steps will be taken to ensure that only qualified public safety or emergency personnel will be able to obtain priority access in times of national emergency.

²⁴ NPRM, paragraph 228.

interpreted to mean that the Commission will put in place procedures assuring that broadcasters are protected from any economically significant interference and that viewers inside the B contour are reasonably protected against harmful interference. Such procedures should be conservative in the sense that they are designed to make the maximum spectrum available for land mobile communications – consistent with providing the necessary protection.

Below we consider three issues: (1) the appropriate calculation of the permitted power levels for land mobile transmitters operating near co-channel television stations, (2) the appropriate calculation of the permitted power levels land mobile transmitters operating near television stations on adjacent channels, and (3) flexible rules which would enhance the possibility of sharing.

First, some background. The current sharing rules were put in place in 1970 and reflected the television receiver population and consumer behavior at the time. Vast changes have occurred since then. A substantial majority of consumers in fringe service areas get their television signals from cable (or to a lesser extent from satellites).²⁵ Antenna and receiving systems at cable television head ends can be engineered to reject interference using technological solutions that are uneconomic on a single household basis. Television sets have improved enormously since 1970.

Many sets today incorporate surface acoustic wave filters (SAW filters) that provide substantially better adjacent channel interference rejection capability than was

²⁵ See Federal Communications Commission, Third Annual Report in the Matter of Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming, CS Docket No. 96-133, FCC 96-496, paragraphs 12-15 and 38.

economically feasible in consumer television receivers in 1970. Similarly, cable television headend receiving and (re)modulating systems provide adjacent channel protection far better than that assumed in developing the 1970 rules. And, of course, the sharing rules will only be transition rules – used for the period from when the land mobile systems go operational (which may be some time from now in rural areas) until the ATV transition ends and digital televisions are repacked into the core.

Co-channel sharing

Experience with the methods used to calculate permitted power for land mobile transmitters (e.g., 47 CFR § 90.307) based upon a 40 dB protection ratio, clearly demonstrates that no unacceptable interference to broadcast television signals has occurred. These tables and procedures were developed in Docket 18261 and used a simplified model of the transmission path and receiving system performance. Thus, Ericsson believes that it must be recognized that simply applying the current methods would provide inappropriate overprotection – thereby wasting spectrum.

Ericsson recommends the formulation of new geographic separation requirements, similar to Table B of the current rules. Such a table may mean that the maximum efficiency will not be achieved in each and every situation, the ease of use of such tables and licensees' familiarity counteracts for the minor loss of optimization. Because the Table must assure that the loss of optimization is minimized, it is especially important to assure that the radio propagation and receiving system models used in the calculations accurately reflects all relevant circumstances. Ericsson believes that two important factors must be explicitly considered. First, the rules should be adjusted to reflect the effects of

antenna directionality (front back ratio). Ericsson believes that the appropriate correction for this term lies in the range of 15 to 20 dB.²⁶

Similarly, it is well known that the effective capture area of many antennas (including the log-periodic antennas commonly mounted on roofs by consumers) decreases with the square of the frequency and that higher frequencies are more strongly attenuated by foliage, reflection from irregular surfaces, and many other propagation impairments. The current rules apply the same separation requirements to all land mobile transmitters operating co-channel with a UHF TV station. However, the rules being considered here will only apply to transmissions in the new land mobile band 746-806 MHz (TV Channels 60 to 69). The difference between the change in the capture area factor from the bottom edge of Channel 14 (where the current rules apply) to the bottom edge of the 746-806 MHz band is a full 4 dB. Ericsson believes that a proper adjustment for the two factors of capture area and propagation impairments combined is about 5 dB.²⁷

Combining these we see that the proper adjustment should lie in the range of 20 to 25 dB. Ericsson recommends using an adjustment permitting power increases for co-channel land mobile operations in the 746-806 MHz band of 20 dB over the power levels that would be permitted under the current rules.

²⁶ Note that the FCC used a front-to-back ratio of 14 dB for planning DTV stations in the UHF band (OET BULLETIN No. 69, Longley-Rice Methodology for Evaluating TV Coverage and Interference, July 2, 1997, Table 6).

²⁷ Note that the FCC used a dipole factor in its DTV planning process which the same as the capture area effect discussed here. See OET Bulletin No. 69, page 3.

Adjacent Channel Sharing

The adjustments described above are based upon physical phenomena (antenna directivity and radio propagation) that do not change rapidly in moving from one channel to the next. However, while it is reasonable to assume that the full front-to-back ratio applies for co-channel operations, the same assumption does not hold for adjacent channel operations. Consequently, the full front-to-back advantage should not be included when calculating adjacent channel protection. Ericsson recommends using an adjustment permitting power increases for adjacent channel land mobile operations in the 746-806 MHz band of 10 dB over the power levels that would be permitted under the current rules.

Protection of Digital Television

The digital television signal is generally far more robust than the analog NTSC signal. Consequently, rules designed to protect NTSC will more than protect DTV.

Permitting Further Sharing

Ericsson supports the Commission's proposal in paragraph 240 of the NPRM to permit land mobile and TV licensees to negotiate to accommodate land mobile operations. Even if all of Ericsson's proposals regarding protection are adopted, the rules will still provide a margin of extra protection. Negotiations between broadcasters and land mobile operators provide an opportunity to move to a more efficient solution. But, the starting place for such negotiations should be rules that, while they protect broadcasters, do not